Fall-plow or Spring-plow In Northeastern Illinois?

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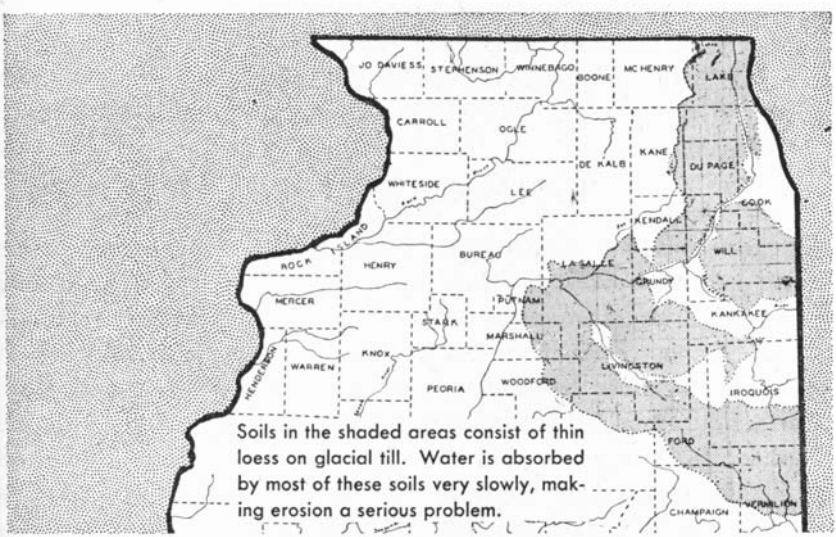
THE PROBLEM whether to fall-plow or to spring-plow is an especially difficult one in many parts of northeastern Illinois. Fall plowing of slopes causes faster erosion than spring plowing. Yet if many of the soils in this region are not plowed in the fall, spring work is often delayed too long, the soil being too wet for proper tillage. The future of many farms in this region depends on finding the correct answer to the above question.



Soils in the shaded areas consist of thin loess on glacial till. Water is absorbed by most of these soils very slowly, making erosion a serious problem.

CIRCULAR 604

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THE ANSWER to the question whether to fall-plow or spring-plow in northeastern Illinois depends largely on the seriousness of the erosion problem. It is therefore the purpose of this circular to point out which soils in the area are badly injured or even permanently destroyed by erosion when they are plowed in the fall, and which soils should be plowed in the fall rather than in the spring.

What These Soils Are Formed From

Most of the sloping soils in northeastern Illinois, as well as some of the nearly level-lying soils, are formed from a thin blanket of loess resting on glacial tills of various kinds. The tills vary from very light, sandy, gravelly, and stony materials to materials that are extremely fine-textured or "heavy." Some of these tills will not form good soil, whereas the loess, which lies on top, is our best parent material. It is important, therefore, to keep the overlying loess in place.

The following discussion concerns soils underlain by heavy glacial tills, thru which water drains only very slowly. Three groups of soils are involved, known as the Clarence-Rowe, the Swygert-Bryce, and the Elliott-Ashkum groups.

Soils with sandy, gravelly, stony tills, which let the water drain thru too rapidly, are not extensive enough in this area to be considered here.

Fall Plowing and Erosion

The advisability of fall plowing should be determined after taking into account its probable effect on the loss of the topsoil by erosion. The topsoil was formed from loess, a good soil-forming material. When this topsoil has been lost by erosion, the agricultural value of the area is greatly reduced and in some places entirely destroyed. The seriousness of the erosion problem in this part of the state has not been fully appreciated even by many of those directly concerned with the continued prosperity of the region.

In a humid climate, such as we have in Illinois, there is excess water to be carried off. This water escapes either by surface runoff or by passing down thru the soil. Both ways of escape cause damage,

but much less harm is done when the water passes down thru the soil than when it runs off the slope with enough velocity to cause appreciable erosion.

In those areas of this northeastern Illinois region which are underlain by slowly permeable tills, a large part of the rainfall runs off the surface. For this reason the sloping soils of the region erode very readily. And erosion in this region is especially harmful because the overlying blanket of good soil-forming material is thin and its loss is a serious matter.

No matter when they are plowed, these sloping soils should, of course, be farmed on the contour in order to slow down the flow of run-off water; grass waterways should be built to carry the water in protected channels to the main drainage lines; and other erosion-control measures should be adopted.

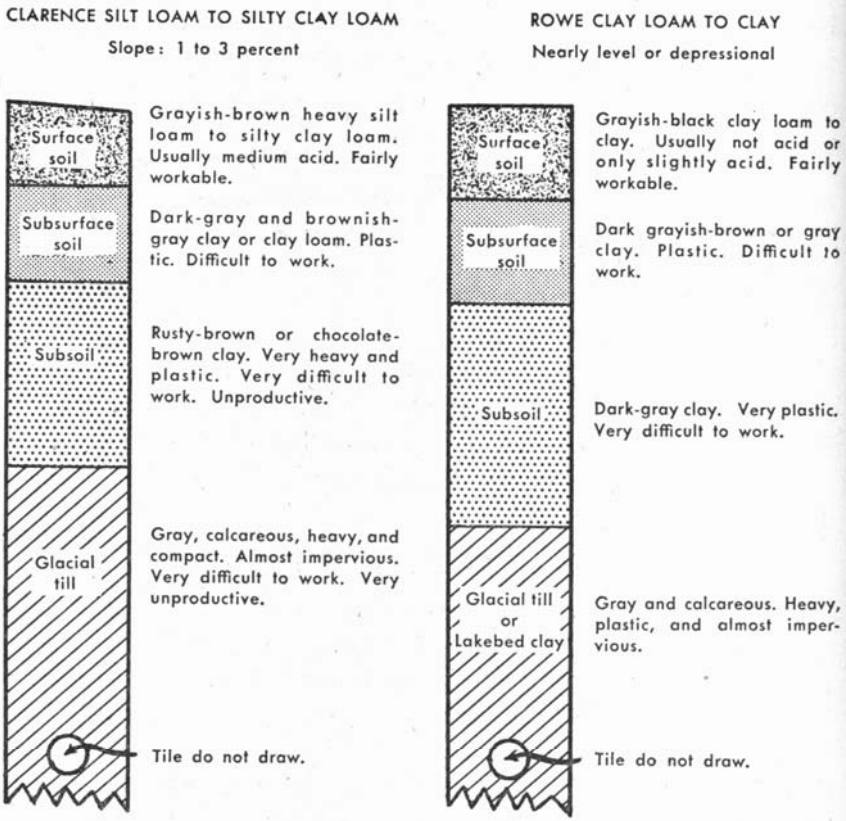
Clarence-Rowe Group of Soils

The soils illustrated in Fig. 1 are known as the Clarence-Rowe group. They are so slowly pervious to water that tile will not draw. If tile are used, some provision must be made for getting the water into the tile lines.

Clarence soils occupy slopes. Since water cannot pass down thru this soil, a large part of the rainfall must run off, causing the soil to erode. The erosion problem on Clarence soils can be solved by protecting the slopes with a vegetative cover, by reducing the speed of the runoff water, and by preventing this excess water from accumulating in unprotected channels.

Fall plowing does none of these things. It leaves the surface unprotected and in condition to quickly crust over, thus reducing still further the power of the soil to absorb water. But if they are not fall-plowed, these slopes often stay wet late into the spring, thus delaying planting too long. The decision that has to be made by each farmer is whether to fall-plow Clarence soils and face the ultimate destruction of the land, or whether to take the chance of spring plowing being too long delayed.

There is, however, another possible alternative on many farms: that is to change from cultivated crops to pasture and meadow on these erosive Clarence soils. Erosion can be reduced to a minimum in this way and the land preserved for many years. If areas of



Areas of Clarence silt loam to silty clay loam (*left*) are sloping. Plow in the spring or, better, keep in pasture and meadow.

Rowe clay loam to clay (*right*) is found on nearly level areas. Plow in the fall. **(Fig. 1)**

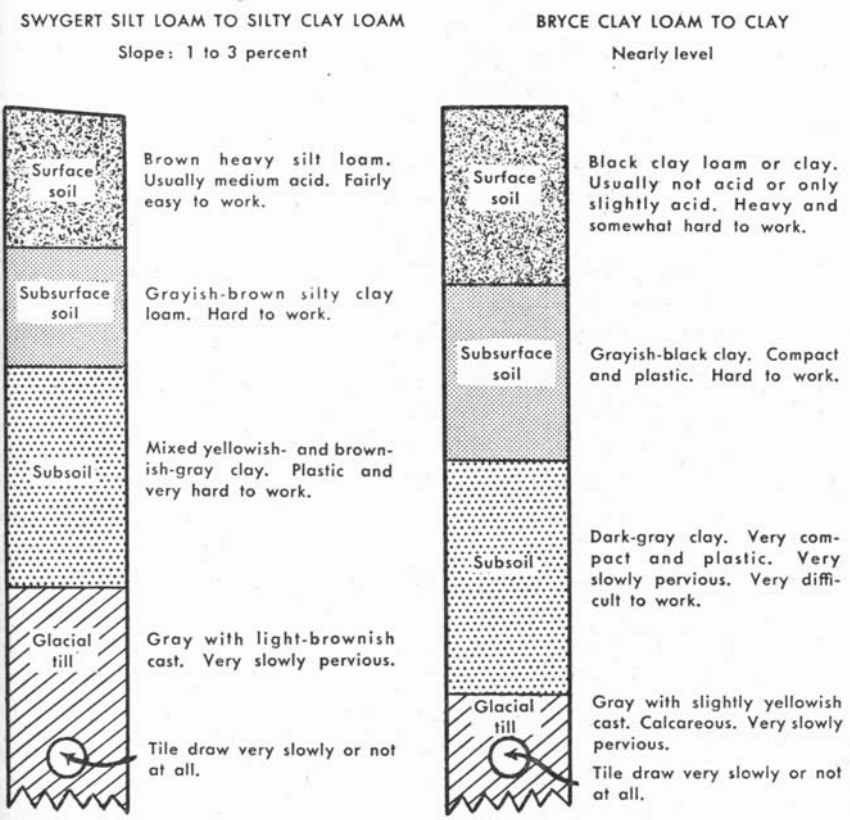
Clarence are used for pasture, the stock should be kept off while the soil is wet; otherwise it will be injured and the returns from pasture reduced.

The level-lying soil associated with Clarence soils, known as Rowe clay loam to clay, should be fall-plowed. It is not subject to erosion. It is so slowly permeable to water and is so nearly level that excess water escapes slowly. With fall plowing and open-ditch drainage, there is little danger of planting being delayed too long in the spring for a good crop. If plowing is postponed until spring, the chances are very high that planting will be delayed too long.

Swygert-Bryce Group of Soils

The second group of soils, the Swygert-Bryce group, is illustrated in Fig. 2. The soils of this group are also only slowly pervious to water but they are somewhat more pervious than are the Clarence-Rowe soils. Observation indicates that the Swygert-Bryce soils will not tile satisfactorily. They present the same management problems as the Clarence-Rowe soils, tho the problems are less acute.

If erosion is permitted to remove a few inches of the topsoil from Swygert, serious and permanent damage results. If the sub-



Swygert silt loam to silty clay loam (*left*) occurs on slopes. Do not fall-plow where the slope is more than 2 percent (2 feet drop in 100 feet).

Bryce clay loam to clay (*right*) occurs on nearly level areas. Always plow in the fall. (Fig. 2)

soil is exposed, it is a question whether the eroded areas can be restored to even moderate productivity.

Where the slope exceeds 2 percent, Swygert should not be fall-plowed, for the same reasons given for not fall-plowing Clarence. Bryce, on the other hand, should be fall-plowed. If well farmed, with a good rotation, it is a satisfactorily productive soil.

Elliott-Ashkum Group of Soils

The Elliott-Ashkum soils are illustrated in Fig. 3. These are the best soils of the three groups. Like the soils of the other two groups, they are formed from a blanket of loess resting on calcareous (limey) glacial till. The till is not readily permeable to water, but it is not as tight as the tills underlying the Clarence-Rowe and Swygert-Bryce soils. If erosion is allowed to expose the subsoil, irreparable damage has been done, tho a reasonably fair stand of grass can be obtained on such areas.

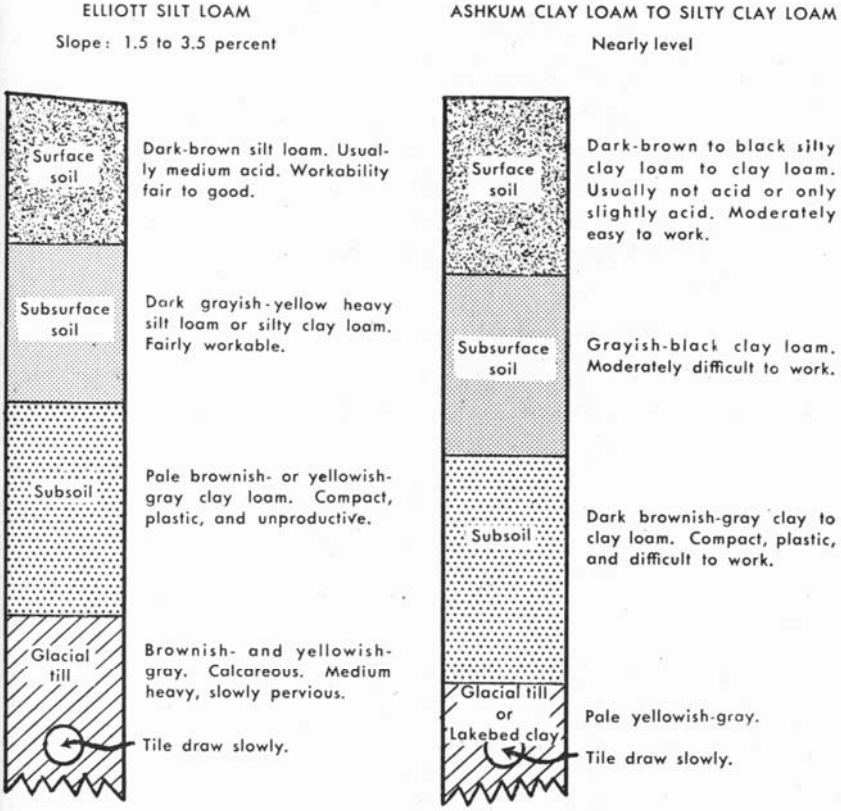
Elliott should not be fall-plowed if the slope exceeds 2 or 2½ percent, while Ashkum should always be fall-plowed.

Observations are somewhat conflicting as to whether tile draw satisfactorily in Elliott and Ashkum. It is likely that the areas mapped as Elliott which have given trouble with tile drainage are nearly heavy enough to be classified as Swygert. A true Elliott soil will tile satisfactorily if the strings of tile are placed closer together than is necessary in a more permeable soil and if they are laid as shallow as it is safe to lay them.

How to Identify These Soils

The intelligent management of the soils in northeastern Illinois with reference to time of plowing depends largely on identifying the Clarence-Rowe, Swygert-Bryce, and Elliott-Ashkum soil groups. Since these are difficult to recognize by inspection, most farmers will want help on this point.

Soil maps for all 18 counties in this area have been published by the ILLINOIS AGRICULTURAL EXPERIMENT STATION, *Urbana,* and can be obtained on request. Only those for Ford, Iroquois, Livingston, and Kendall counties, however, locate these three groups of soils and identify them by name. Farmers and landown-



Elliott silt loam (*left*) occurs on slopes. Do not fall-plow where the slopes are more than 2 to 2¼ percent.

Ashkum clay loam to silty clay loam (*right*) is found on nearly level areas. Always plow in the fall. (Fig. 3)

ers in the other 14 counties can find out whether their soils are in any of the problem groups by consulting the farm adviser or by writing to the Experiment Station. Anyone desiring this information should be sure to give the exact legal location of the tract in question.

Besides the soils underlain with unfavorable glacial tills, there are others in this area that have till of medium texture and present no special plowing or drainage problem. These more favorable soils are scattered thru the 18 counties. Two areas of considerable size are located in southwestern Kendall county and east-central Iroquois county in the region of Sheldon.

Producing Power of Three Soil Groups

The present producing capacity of the Clarence-Rowe, Swygert-Bryce, and Elliott-Ashkum soils is shown in the following table. These yields were obtained from farms where records of soil treatment, management, and yields have been kept, most of them in cooperation with the Department of Agricultural Economics of the University of Illinois and the farm bureau.

Yields of Hybrid Corn, Oats, and Soybeans Under Good and Fair Management[a]

(Bushels per acre)

Soil group	Hybrid corn 1937-1944		Oats 1925-1944		Soybeans 1925-1944	
	Good mgt.	Fair mgt.	Good mgt.	Fair mgt.	Good mgt.	Fair mgt.
Clarence-Rowe	51	40	36	27	20	16
Swygert-Bryce	60	47	39	32	21	19
Elliott-Ashkum	64	59	42	38	23	21

[a] **Good** management means that a rotation is followed that requires at least ⅕ of the cultivated land to be in legume hay or pasture or ⅓ in a catch crop plowed under; and that limestone, phosphate, and potash are applied in amounts which tests indicate are needed.

Fair management means that a rotation is used that requires 1/10 to ⅕ of the cultivated land to be in legume hay or pasture, ⅕ to ⅓ in a legume catch crop plowed under as green manure; and that limestone is applied in such amounts as the acidity test indicates are needed.

All These Soils Are Worth Saving

Three things are shown by these yields:

1. The three soil groups differ markedly in yielding capacity.
2. They are all worth saving.
3. Good management is important, especially with the two poorer groups of soils — Clarence-Rowe and Swygert-Bryce.

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